INSTRUCTIONS FOR LANDFILL POST-CLOSURE COST ESTIMATE WORKSHEET WITH KDHE/BWM PROVIDED UNIT COSTS

NOTES:

The Bureau has analyzed data from July 1, 2013 – March 31, 2014 permit renewal period and developed unit cost factors for closure and post-closure care for landfills by landfill type. This year the forms will provide unit costs for all items **that are not landfill specific** or in other words unit costs were provided only if the items were not event or geology specific. An example of a non-landfill specific closure item would be the cost for seeding and mulching per acre. Conversely, an example of a **landfill specific post-closure care item** would be the cost estimate for sampling groundwater quality since this cost estimate will depend on the number of monitoring wells.

Use a separate worksheet for each landfill type and /or each permit number.

The calculated costs shall include the costs to complete all post-closure activities in a manner consistent with the approved facility post-closure plan.

To determine the area or capacity to be included in the calculation of estimated cost; for each solid waste disposal area, calculate the cost to be incurred for the largest area to have waste in place before the next annual permit renewal. The calculated cost shall include the cost to conduct the following, in a manner consistent with the approved facility post-closure plan, during the post-closure period of 30 years and any extensions of the post-closure period required by the Secretary:

1) Care and maintenance of the area, including all appurtenances; and
2) All required environmental monitoring.

The closure cost estimate must be calculated using third party costs from one or more of the authorized sources:

1) Representative costs supplied by the department;
2) Actual invoices paid by the owner or operator for the same or similar work;
3) Written bids from professional contractors having no other financial interest in the facility or its use; and
4) Authoritative costing tables issued by publishers recognized for their research into the costs of the activities to be priced.

Post-closure financial assurance may not be required for a facility, if the care and maintenance costs are deemed minimal and if environmental monitoring is not required. This normally exempts many construction & demolition landfills and tire monofills.

Please supply KDHE with the source of your unit cost. Omit quantities and costs for items that are not applicable to this facility and write NA instead.

POST-CLOSURE ITEMS:

1.0.0 Final Cover Routine Maintenance

1.0.1 Inspect soil cover, vents, flares, drainage letdowns and outfalls, etc…: Cost includes the inspection of soil cover, vents, flares, drainage letdowns, outfalls and all other structures remaining at the closed landfill.

1.0.2 Mowing/Trimming total acres twice per year: Cost includes mowing and trimming the final landfill cover or cap in order to prevent the growth of woody brush and trees.

1.0.3 Clean Drain/Vent Openings: Cost includes the cleaning of drains and vents.

1.0.4 Final Cover Routine Maintenance Subtotal: Total of 1.0.1, 1.0.2 and 1.0.3.

2.0.0 FINAL COVER REPAIRS

2.0.1 Remove/incorporate unacceptable materials (e.g. dead vegetation, solid waste): Cost includes the removal and/or disposal of unacceptable material that is exposed at the surface of the landfill cover.

2.0.2 Scarify and prepare surface: Cost includes scarifying and preparing the surface to receive additional soil to repair the cover.

2.0.3 Soil, on-site (excavate, transport, place, compact): Cost includes the excavation, transportation, placement and compaction of on-site soil.

2.0.4 Soil, off-site (purchase, transport, place, compact): Cost includes the purchase, transportation, placement and compaction of off-site soil. *Do not include this item if soil is available on-site.*

2.0.5 Seeding and mulching: Cost includes the purchase and application of grass seed and of 1" of straw mulch.

2.0.6 Fertilizer: Cost includes the purchase and application of appropriate, grass fertilizer.

2.0.7 Final Cover Repairs Subtotal: Total of 2.0.1, 2.0.2, 2.0.3, 2.0.4, 20.05 and 2.0.6.

3.0.0 ACCESS ROAD REPAIRS

3.0.1 Reshape/regrade subgrade: Cost includes the reshaping and regrading of access road subgrade prior to placement of gravel surface.

3.0.2 Gravel (purchase, transport, place): Cost includes the purchase, transportation and placement of the gravel on the road surface.

3.0.3 Drainage Structures (e.g. culverts): Cost includes the replacement and/or the addition of new drainage structures needed to complete access road repairs.

3.0.4 Riprap ditching/channels: Cost includes the purchase, transportation and placement of riprap in the ditches and channels.

3.0.5 Access Road Repairs Subtotal: Total of 3.0.1, 3.0.2, 3.0.3 and 3.0.4.

4.0.0 SURFACE WATER MANAGEMENT O&M

4.0.1 Collection system operation and maintenance (ditches, piping conveyances, outfalls, sampling points repair/replace): Cost includes everything required to operate and maintain the surface water collection system including but not limited to ditches, piping conveyances, outfalls and sampling points.

4.0.2 Stormwater storage (sediment pond) operation/repairs: Cost includes everything required to operate and repair sediment pond(s) for stormwater storage.

4.0.3 Sample collection (____events per year): Cost includes the transportation of personnel and equipment to the site and the sampling of surface water from sediment pond(s). Costs also include decontamination of the sampling. Costs are based on the number of sampling events per year multiplied by the number of sediment ponds sampled.

4.0.4 Sample analysis and reporting (____events per year): Cost includes analysis of sediment pond water samples. Costs are based on the number of sampling events per year multiplied by

the number of sediment ponds sampled.

4.0.5 Surface Water Management O&M Subtotal: Total of 4.0.1, 4.0.2, 4.0.3 and 4.0.4.

5.0.0 LEACHATE COLLECTION SYSTEM O&M

5.0.1 Generation Rate = _____ gal./ac./yr.

5.0.2 Clean Leachate Line: Cost includes cleaning the residue from the inside of the leachate line and disposing of the material removed from the line.

5.0.3 Collection operation/maintenance (pump, piping, storage…operation/repair/replace): Cost includes the operation, the repairing and /or the replacement of leachate pumps, piping and storage systems.

5.0.4 Leachate loading, off-loading and off-site transportation: Cost includes the loading, off loading and transportation of the leachate to an off-site disposal or treatment facility.

5.0.5 Leachate Treatment/Disposal: Cost includes required treatment and/or disposal of leachate.

5.0.6 Additional/upgrades for piping, pumps and storage: Cost includes adding new or upgrading existing leachate pumps, piping and storage systems.

5.0.7 Leachate sample collection: Cost includes drawing leachate samples for analysis. The cost should also include mobilization and mileage to bring personnel on- site.

5.0.8 Leachate sample analysis and reporting: Cost includes annual leachate analysis for each unit for parameters listed in K.A.R. 28-29-107 (i)(6)(B).

5.0.9 Leachate Collection System Annual O&M Subtotal: Total of 5.0.1, **5.0.2, 5.0.3, 5.0.4, 5.0.5, 5.0.6 and 5.0.7.**

6.0.0 GROUNDWATER MONITORING SYSTEM O&M

6.0.1 Number of Wells in Approved System = _____

6.0.2 Well maintenance (e.g. protective casing (locks & hinges) repair/replacement, well pad repair/replace, etc…): Cost includes repair or replacement of well pads, repair of protective casing and padlocks. Cost includes labor and materials and should assume a minimum of 4 hours of labor per well, prorated over 30 years.

6.0.3 Abandon and plug wells: Cost includes removal and disposal of the concrete pad, the steel protective casing and a minimum of the top 10' of the well casing. It also includes plugging the well with bentonite and with completing and submitting the WWC5 well forms.

6.0.4 Rehabilitate/redevelop existing well: Cost includes labor and materials to rehabilitate or redevelop the existing well. The cost should also include mobilization and mileage to bring personnel and equipment on-site.

6.0.5 Well replacement: Cost includes replacement of 50% of the groundwater wells over the 30-year post-closure period and includes the complete well installation and completing and submitting the WWC5 well forms.

6.0.6 Sample collection (2 events per year): Cost includes the transportation of personnel and equipment to the site and the sampling of the groundwater wells according to the approved Sampling and Analysis Plan. Costs also include decontamination of the sampling and depth sounding equipment. Costs are based on 2 sampling events per year multiplied by the number of wells sampled.

6.0.7 Sampling analysis and reporting (2 events per year): Cost includes analysis of groundwater samples from all monitoring wells within the approved system twice a year for all constituents listed in Appendix I of K.A.R. 28-29-113 for landfills and submittal of the groundwater sampling event report as defined in the Sampling and Analysis Plan.

6.0.8 Groundwater Monitoring System O&M Subtotal: Total of 6.0.1, 6.0.2, 6.0.3, 6.0.4, 6.0.5 and 6.0.6.

7.0.0 GAS MONITORING SYSTEM O&M

7.0.1 Number of Gas Monitoring Probes = _____

7.0.2 Methane Monitoring of Probes (4 per year): Cost includes labor and equipment to monitor probes and transportation of personnel and equipment to the site. Costs are based on 4 monitoring events per year multiplied by the number of probes monitored.

7.0.3 Methane Monitoring at Site Boundaries and Structures (4 per year): Cost includes labor and equipment to monitor probes at the site boundaries and structures as well as the transportation of personnel and equipment to the site. Costs are based on 4 monitoring events per year multiplied by the number of probes monitored.

7.0.4 Sampling analysis and reporting: Cost includes submittal of a written report detailing the analysis of the gases detected during the monitoring of each of the gas probes.

7.0.5 **Gas Monitoring System O&M Subtotal:** Total of 7.0.1, 7.0.2, 7.0.3 and 7.0.4

8.0.0 GAS EXTRACTION SYSTEM O&M

8.0.1 Gas vents, _____# of vents, _____ average depth

8.0.2 Passive System

8.0.3 Passive gas well head turbine maintenance: Cost includes repair and replacement of turbines.

8.0.4 Active System

8.0.5 Flare, _____ BTU/hour

8.0.6 Additional well installation/rehabilitate: Cost includes the labor and materials to install new gas wells, the cost to transport personnel, materials and equipment to the site and the fees to design number and location of new gas wells. Cost also includes the labor and materials to rehabilitate the gas well and the cost to transport personnel and materials to the site.

8.0.7 Ancillary gas equipment repair/replacement (piping, blowers, condensate collection): Cost includes the labor and materials needed to repair or replace piping, blowers and condensate collection system and the cost to transport personnel and material to the site.

8.0.8 Gas Extraction System O&M Subtotal: Total of 8.0.3, 8.0.6 and 8.0.7.

9.0.0 CORRECTIVE ACTION EVALUATION AND IMPLEMENTATION

9.0.1 Resurvey monitoring well reference points and site benchmarks (prorate for annual expenses): Cost includes resurveying the monitoring well reference points and site benchmarks. Cost should be prorated over the post-closure time period.

9.0.2 Remove sediments from stormwater basin(s) (prorate for annual expenses): Cost includes the labor and equipment (including the transportation of personnel and equipment) require for the removal of sediments from the stormwater basin(s) and the disposal of those sediments. Cost should be prorated over the post-closure time period.

9.0.3 Groundwater exceedances statistical evaluation: Cost includes the labor of a groundwater expert to evaluate exceedances of the statistical analysis of the groundwater sample analysis.

9.0.4 Groundwater alternate source determination: Cost includes

consultant fees for performing the alternate source determination. Cost should be prorated over the post-closure time period.

9.0.5 Other _____

Fill in the blank with a list of items that are deemed necessary.

9.0.6 Corrective Action Evaluation and Implementation Subtotal: Total of 9.0.1, 9.0.2, 9.0.3, 9.0.4 and 9.0.5.

10.0.0 POST-CLOSURE CARE ANNUAL COST SUBTOTAL: Total of 1.0.4, 2.0.7, 3.0.5, 4.0.5, 5.0.9, 6.0.8, 7.0.5, 8.0.6 and 9.0.6.

11.0.0 Administrative Services (Post-Closure Cost Subtotal [10.0.0] X 6%): Cost = 6% of the Post-Closure Care Annual Cost Subtotal

12.0.0 Contingency (Post-Closure Cost Subtotal [10.0.0] X 10%): Cost = 10% of the Post-Closure Care Annual Cost Subtotal

13.0.0 PROFESSIONAL SERVICES (Post-Closure Cost Subtotal [10.0.0] X 7%) or Enter costs provided by third party with sources listed in line items below: Cost = 7% of the Post-Closure Care Annual Cost Subtotal or as provided by third party source.

13.0.1 Engineering (annual inspection and reporting, corrective action design and bid, contract management): Cost include engineering for annual inspection and reporting, corrective action design and bid, contract management.

13.0.2 Topographic and Boundary Survey: Cost includes labor, transportation and drafting for topographic and boundary survey.

13.0.3 Corrective Action Engineering Services (construction oversight, testing, reporting, certification): Cost includes engineering services for construction oversight, testing, reporting and certification.

14.0.0 Subtotal of Line Items 11.0.0 through 13.0.3: Total of 11.0.0, 12.0.0, 13.0.0, 13.0.1, 13.0.2, and 13.0.3.